UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM REQUESTS FOR RELIEF

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NUMBER 50-293

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where alternatives are authorized or relief is granted by the Commission pursuant to 10 CFR 50.55a(a)(3)(i), (a)(3)(ii), or (f)(6)(i). In order to obtain authorization or relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provided alternatives to the Code requirements determined to be acceptable to the staff. When an alternative is proposed which is in accordance with GL 89-04 guidance and is documented in the IST program, no further evaluation is required; however, implementation of the alternative is subject to NRC inspection.

In rulemaking to 10 CFR 50.55a, effective September 8, 1992 (See 57 Federal Register 34666), the 1989 Edition of ASME Section XI was incorporated in paragraph (b) of 50.55a. The 1989 Edition provides that the rules for IST of pumps and valves shall meet the requirements set forth in ASME Operations and Maintenance Standards Part 6 (OM-6), "Inservice Testing of Pumps in Light-Water Reactor Power Plants", and Part 10 (OM-10), "Inservice Testing of Valves in Light-Water Reactor Power Plants." Pursuant to 50.55a(f)(4)(iv), portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met; therefore, relief is not required for those inservice tests that are conducted in accordance with OM-6 and OM-10, or portions thereof. Whether all related requirements are met is subject to NRC inspection.

The Code of Federal Regulations of 10 CFR 50.55a authorizes the Commission to approve alternatives or grant relief from ASME Code requirements upon making the necessary findings. The NRC staff's findings with respect to relief requested and alternatives proposed as part of the licensee's IST program are contained in this safety evaluation (SE).

The IST program addressed herein covers the third ten-year interval which began December 10, 1992, and ends December 9, 2002. This SE concerns relief requests in Revision 4 of the Pilgrim Nuclear Power Station IST program that was submitted by Boston Edison Company (the licensee) in a letter dated November 25, 1992. The licensee's program is based on the requirements of Section XI of the ASME Code, 1986 Edition.

2.0 EVALUATION

The licensee's IST program requests for relief from the requirements of Section XI have been reviewed by the staff with the assistance of its contractor, EG&G Idaho, Inc. (EG&G). The technical evaluation report (TER) provided as Attachment 1 is EG&G's evaluation of the licensee's IST program relief requests in the submittal dated November 25, 1992. The staff has reviewed the TER and concurs with the evaluations and conclusions contained therein. A summary of the relief request determinations is presented in Table 1. The granting of relief or authorization of proposed alternatives is based upon the fulfillment of any commitments made by the licensee in its basis for each relief request and the alternatives proposed. The implementation of the licensee's IST program is subject to inspection by the NRC.

The licensee's IST program contained several relief requests for non-Code components. These components are not required by 10 CFR 50.55a to be included in the IST program, though it is acceptable to include the components to meet testing requirements of 10 CFR Part 50, Appendix A and Appendix B. Relief requests related to these components, however, are not evaluated by the staff pursuant to 50.55a. The relief requests for these components are listed in Table 1 of the SE.

The licensee should refer to the TER, Appendix A, for a discussion of IST program anomalies identified during the review. The licensee should resolve all items in accordance with the guidance therein.

For check valves which are included in a disassembly and inspection program, the guidance delineated in GL 89-04, Attachment 1, Position 2, must be followed for approval per GL 89-04. Position 2 includes guidance for extension of the disassembly/inspection interval to longer than once every 6 years and the documentation for supporting the extension. The information is to be available on-site for NRC inspection. If the guidance is not followed, the licensee may follow the requirements of OM-10, pursuant to 50.55a (f)(4)(iv), and perform disassembly and inspection of each valve each refueling outage. By implementing the sampling program per the guidance in Position 2, it is expected that all of the guidance will be addressed. Implementation is subject to NRC inspection.

3.0 CONCLUSION

In evaluating the licensee's requests for relief from the requirements of Section XI, the staff considered: (1) the acceptability of proposed alternative testing; (2) whether the hardship of compliance is without a compensating increase in safety; (3) the impracticality of performing the required testing considering the burden if the requirements were imposed; and (4) whether the proposed alternative testing meets the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of 50.55a. The last column of Table 1 identifies the regulation or GL 89-04 guidance under which the requested relief is approved. The NRC staff has determined that granting relief or approving alternatives pursuant to 10 CFR 50.55a is authorized by law and will not endanger life or property, or the common defense and security and is otherwise in the public interest. The granting of relief or authorization of proposed alternatives is based upon the fulfillment of any commitments made by the licensee in its basis for each relief request and the proposed alternate testing.

Principle Contributor: Joseph Colaccino

Date: June 23, 1993
Attachment 1: TER

PILGRIM NUCLEAR POWER STATION
SAFETY EVALUATION TABLE 1
SUMMARY OF RELIEF REQUESTS

Relief Request Section	TER Section	Section XI Requirement and Subject	Equipment Identification	Alternate Method of Testing	Action by USNRC
Pump RP-1	2.2.1	IWP-3100: Measure flow rate quarterly	Reactor building closed cooling water (RBCCW) pumps: P-202A through -202F	Measure shutoff head quarterly, measure individual pump flow rate and pressure each refueling outage.	Relief Granted with provision (f)(6)(i)
Pump RP-2	2.1.1	IWP-3100: Measure bearing temperature	All Code Class pumps in the IST program.	Measure vibration velocity at the same locations as required by Section XI. Perform a spectrum analysis if vibration exceeds 0.314 in./sec.	Approved pursuant to 10 CFR 50.55a (f)(4)(iv)
Pump RP-3	2.3.1	IWP-3300, -3500, and -4600: Test duration, measure flow rate, and measure inlet and differential pressures	Standby liquid control pumps: P-207A and -207B	Evaluate discharge pressure, verify test tank level to ensure adequate suction pressure, run test for three minutes and calculate flow rate based on change in test tank level over time.	Approved pursuant to (f)(4)(iv) for test duration and inlet and differential pressures. Relief Granted with provision (f)(6)(i) for flow rate calculation
Pump RP-4	2.4.1	IWP-3100: Measure inlet pressure	Salt service water pumps: P-208A through -208E	Calculate inlet pressure from the tide level.	Approved pursuant to (f)(4)(iv), with provision
Pump RP-5	2.4.2	IWP-3100: Measure flow rate quarterly	Salt service water pumps: P-208A through -208E	Measure shutoff head quarterly and measure pump flow rate each refueling outage.	Relief Granted with provision (f)(6)(i)
Pump RP-6	2.4.3	IWP-4510: Vibration measurement location	Salt service water pumps: P-208A through -208E	Measure vibration at upper motor bearing housing.	Approved pursuant to (f)(4)(iv), with provision
Pump RP-7	N/A	Request retracted	N/A	N/A	N/A
Pump RP-8	2.1.2	IWP-3220: Analyze test results within 96 hours	All Code Class pumps in the IST program	Compare results to acceptance criteria immediately and analyze within 96 hours, excluding weekends and holidays.	Alternate Authorized (a)(3)(i)
Pump RP-9	2.1.3	IWP-4120: Instrument range requirement	All Code Class pumps in the IST program	Measure vibration with analog meter with selectable scales, take readings within upper 70% of meter's full-scale.	Approved pursuant to (f)(4)(iv), with provision

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Pump RP-10	N/A	Request retracted	N/A	N/A	N/A
Valve RV-01	3.2.2.1	IWV-3521: Test frequency	RBCCW drywell isolation check valve: 432	Exercise every two years.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-02	3.12.1.1	IWV-3521: Test frequency	Pneumatic supply to drywell isolation check valve: 167	Exercise open and closed during each refueling interval.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-03	3.13.1.1	IWV-3420: Leak rate test	Suppression chamber to drywell vacuum breaker valves: X-201A through H, -201J, and -201K	Perform a pressure decay test quarterly and combined leak rate test per plant Technical Specifications (TS) during each refueling interval.	Relief Granted (f)(6)(i)
Valve RV-04	N/A	IWV-3417(a): Corrective action	Various rapid-acting power operated valves	Assign 2 second stroke time limit.	Approved by GL 89-04, Position 6, request not evaluated in SE/TER.
Valve RV-05	3.14.1.1	IWV-3521: Test frequency	Transverse incore probe (TIP) nitrogen purge line check valve	Exercise open and closed at least once every two years.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-06	3.3.1.1	IWV-3521: Test frequency	Core spray injection isolation check valves: 9A and 9B	Exercise during refueling outages.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-07	3.4.2.1	IWV-3413: Stroke time measurement	High pressure coolant injection (HPCI) turbine trip throttle valve: 24	Observe proper system operability.	Relief Granted (f)(6)(i)
Valve RV-08	3.7.1.1	IWV-3521: Test frequency	Standby liquid control injection check valves: 15 and 16	Exercise valves open each refueling outage.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-09	N/A	IWV-3411, -3413, -3415, -3521: Test method and frequency	Scram inlet and outlet valves: 126 and 127; hydraulic control unit (HCU) charge header and accumulator supply check valves: 114 and 115	Perform scram functional timing per plant TS. Exercise valves 114 and 115 open during scram functional testing, verify closure of valve 115 each refueling outage.	Approved by GL 89-04, Position 7, request not evaluated in SE/TER.

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Relief Request Section	TER Section	Section XI Requirement and Subject	Equipment Identification	Alternate Method of Testing	Action by USNRC
Valve RV-10	N/A	IWV-3521: Test frequency	Control rod drive (CRD) cooling water check valves: 138	Exercise per TS surveillance requirements.	Approved by GL 89-04, Position 7, request not evaluated in SE/TER.
Valve RV-11	3.8.1.1	IWV-3411, and -3413: Test frequency and stroke time measurement	Main steam automatic depressurization system (ADS) and safety relief valves: 3A through 3D	Exercise during refueling outages, do not measure stroke times, verify timely system response.	Alternate Authorized for Interim Period (a)(3)(i), for 1 year or until the next refueling outage
Valve RV-12	3.8.1.3	IWV-3521: Test frequency	Feedwater header check valves: 58A, 58B, 62A, and 62B	Exercise at least once every two years.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-13	3.11.1.1	IWV-3521: Test frequency	Recirculation pump seal water system isolation valves: 13A, 13B, 17A and 17B	Exercise at least once every two years.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-14	N/A	Request retracted	N/A	N/A	N/A
Valve RV-15	N/A	Request retracted	N/A	N/A	N/A
Valve RV-16	3.5.1.1	IWV-3413: Stroke time measurement	Reactor core isolation cooling (RCIC) turbine governor valve: 2	Observe proper system operability.	Relief Granted (f)(6)(i)
Valve RV-17	3.9.1.1	IWV-3411 and -3413: Test frequency and stroke time measurement	Rod insertion and withdrawal valves: 120, 121, 122, and 123	Verify operation weekly by notching control rods.	Relief Granted (f)(6)(i)
Valve RV-18	N/A	IWV-3522(b): Test method	Main steam isolation valve (MSIV) accumulator air supply check valves: 84A, B, C, D, 85A, B, C, and D	Verify full-stroke open capability by MSIV full-stroke valve cycle testing.	Non-Code Class components, request not evaluated in SE/TER

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Relief Request Section	TER Section	Section XI Requirement and Subject	Equipment Identification	Alternate Method of Testing	Action by USNRC
Valve RV-19	N/A	IWV-3422: Test frequency	Diesel generator air start valves listed in the IST program	Verify operation during monthly diesel start tests, trend diesel start times.	Non-Code Class components, request not evaluated in SE/TER
Valve RV-20	3.6.2.1	IWV-3521: Test frequency	Residual heat removal (RHR) and core spray keepfill pressurization check valves: 1001-362B, -363A, 1400-212A, and -212B	Part-stroke exercise open quarterly and verify a full-stroke exercise open during each refueling interval.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-21	3.10.1.1	IWV-3521: Test frequency	RWCU return flow path to reactor vessel check valve: 81	Exercise closed during leak testing each refueling outage.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-22	3.1.1.1	IWV-3422 and -3521: Test frequency	All primary containment isolation excess flow check valves	Exercise and leak rate test each refueling outage.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-23	N/A	IWV-3521: Test frequency	Emergency diesel generator fuel oil supply check valves: 116A and 116B	Verify full-stroke open during emergency diesel generator testing.	Non-Code Class components, request not evaluated in SE/TER
Valve RV-24	N/A	Request retracted	N/A	N/A	N/A
Valve RV-25	3.4.1.1	IWV-3413: Test method	HPCI system turbine exhaust drain pot isolation valves: 9068A and 9068B	Verify closure by system operation and by performing local leak rate testing.	Interim Relief Granted (f)(6)(i), until refueling outage No. 9
Valve RV-26	3.9.1.2	IWV-3411 and -3413: Test frequency and stroke time measurement	Rod scram discharge volume drain valves: 21A, 21B, 22A, 22B, 23A, 23B, 24A and 24B	Measure the closed stroke times and trend this data each refueling outage.	Relief Granted (f)(6)(i)
Valve RV-27	N/A	IWV-3522: Test method and frequency	Various check valves identified in the IST program	Disassemble and inspect valves per GL 89-04, Position 2.	Approved by GL 89-04, Position 2, request not evaluated in SE/TER

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Relief Request Section	TER Section	Section XI Requirement and Subject	Equipment Identification	Alternate Method of Testing	Action by USNRC
Valve RV-28	N/A	IWV-3427(b): Leak testing corrective action requirements	All containment isolation valves	Repair or replace valves as determined by licensee or when leakage rate exceeds plant TS limit or IWV-3427(a).	Approved by GL 89-04, Position 10, request not evaluated in SE/TER
Valve RV-29	3.1.5.1	IWV-3417(a): Corrective action	Various power-operated valves listed in the IST program	Compare stroke times against reference stroke times.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-30	3.1.2.1	IWV-3424, -3426, and -3427: Leak rate testing requirements	All leakage important valves listed in the IST program	Perform pressure decay tests utilizing a pressure boundary specified leakage limit.	Relief Granted (f)(6)(i)
Valve RV-31	3.15.1.1	IWV-3413: Stroke time measurement	Hydrogen/oxygen analyzer reagent gas valves: 5117A, 5117B, 5137A, and 5137B	Measure stroke times by positioning the function selector switch and observing flow meter indication.	Relief Granted with provision (f)(6)(i)
Valve RV-32	3.2.1.1	IWV-3411: Test frequency	RBCCW to drywell isolation valves: 4009A, 4009B, and 4002	Exercise during cold shutdowns when reactor recirculation pumps are stopped and drywell coolers are not required and during refueling outrages.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-33	3.8.2.1	IWV-3411: Test frequency	Reactor recirculation pump discharge valves: 5A and 5B	Exercise during cold shutdowns when recirculation pump is stopped but not to exceed a refueling interval.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-34	3.2.3.1	IWV-3411: Test frequency	RBCCW loop A isolation valves: 4085A and 4085B	Exercise during cold shutdowns when recirculation pumps are stopped and during refueling outages.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-35	N/A	IWV-3521: Test frequency	Main steam safety/relief discharge line vacuum relief check valves: 96A through C, 97A through D, and 98A through D	Exercise valves open during cold shutdowns when containment is deinerted.	Non-Code Class components, request not evaluated in SE/TER

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Relief Request Section	TER Section	Section XI Requirement and Subject	Equipment Identification	Alternate Method of Testing	Action by USNRC
Valve RV-36	N/A	IWV-3521: Test frequency	Air accumulator supply valves for ADS valves: 372A through D	Exercise during cold shutdowns when the drywell is deinerted at least each refueling outage.	Non-Code Class components, request not evaluated in SE/TER
Valve RV-37	3.1.3.1	IWV-3521: Test frequency	Various check valves listed in the relief request	Valve seat leakage test performed at least once every two years.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-38	3.2.4.1	IWV-3521: Test frequency	RBCCW pump discharge check valves: 30-CK-419 through 424	Perform open position verification in conjunction with the respective pump flow rate measurement.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-38	3.16.1.1	IWV-3521: Test frequency	Salt service water pump discharge check valves: 29-CK-3880A through 3880E	Perform open position verification in conjunction with the respective pump flow rate measurement.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-39	3.1.4.1	IWV-3417(b) and -3523: Corrective action	All valves in the IST program	Plant entry into operational modes shall be governed by plant TS.	Alternate Authorized (a)(3)(i) with provisions
Valve RV-39	3.1.4.1	IWV-3417(b): Corrective action	All power operated valves in the IST program	Plant startup shall be governed by plant TS.	Approved pursuant to (f)(4)(iv), with provision
Valve RV-40	3.8.1.2	ANSI/ASME OM-1-1987, Section 3.3, Test method	Main steam ADS and safety relief valves: 3A, 3B, 3C, and 3D	Remove the pilot assemblies and test them using a slave main valve body.	Alternate Authorized (a)(3)(i)
Valve RV-41	3.6.1.1	IWV-3521: Test frequency	RHR to recirculation loop injection check valves: 68A and 68B	Part-stroke exercise alternately during cold shutdowns and verify a full-stroke using diagnostics once each refueling interval.	Approved pursuant to (f)(4)(iv), with provision